

# Transportation

"Providing the highest quality integrated transportation services for economic benefit and improved quality of life."



## Transportation Is The Backbone of Michigan's Economy

- 35% of US/Canada trade flows through Michigan
- Michigan leads all states in trading with Canada, totaling \$75 billion in 2013 (11.8% of U.S./Canada trade)
- \$520 billion in freight is moved each year on Michigan's highways, rail and water ports
- Trucking accounts for 67% of all freight tonnage moved in Michigan



## Transportation Is The Backbone of Michigan's Economy

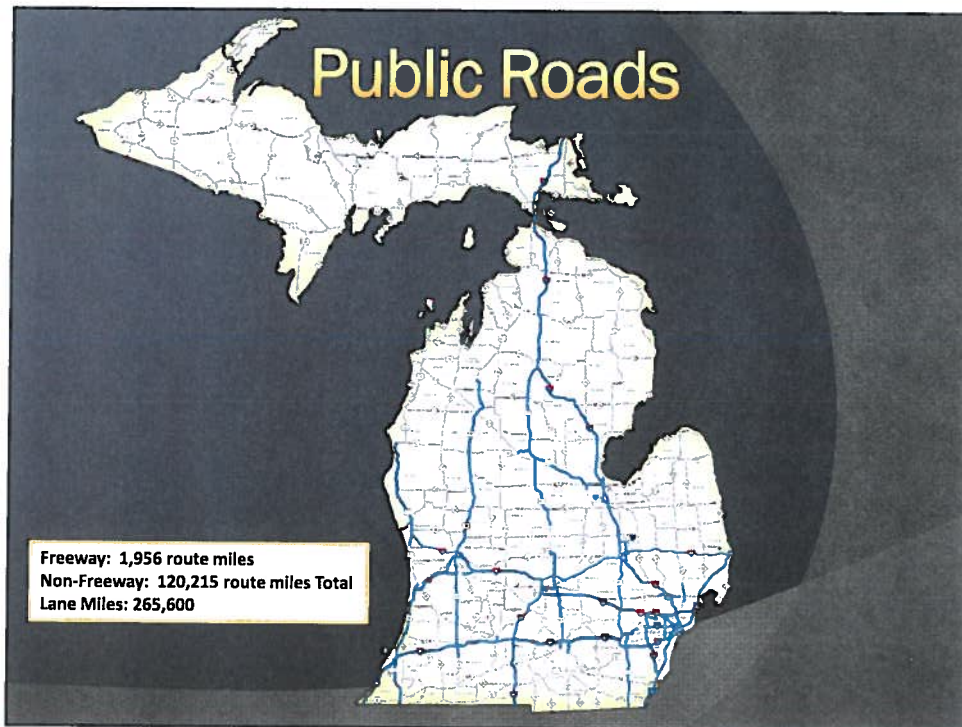
- Operation of bus transit systems contribute an estimated \$740 million to the economy each year
- Passenger rail is expected to generate between \$1.0-1.5 billion in net economic benefit annually
- Freight rail moves 19% of Michigan's freight tonnage annually
- Aviation contributes more than \$20 billion/year
- 80% of Michigan tourism is auto-based.

MDOT

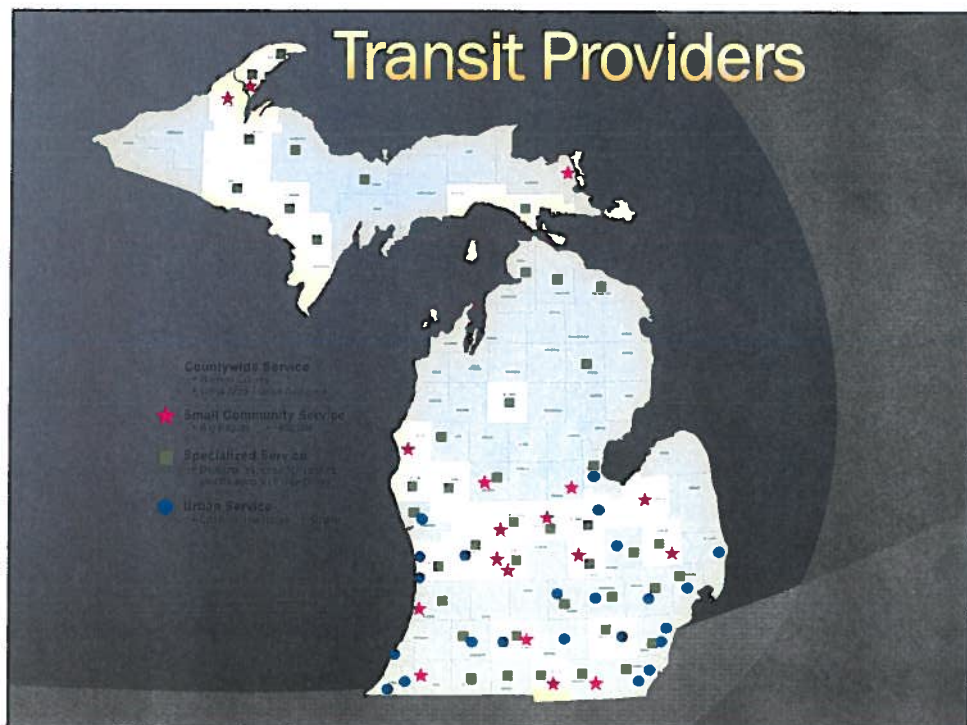
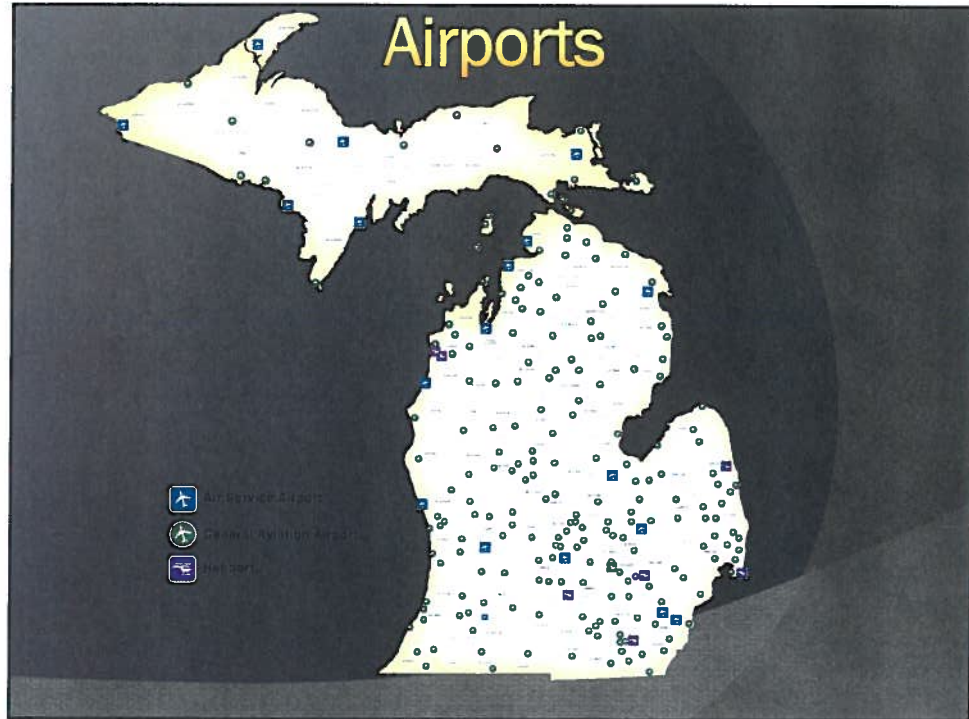


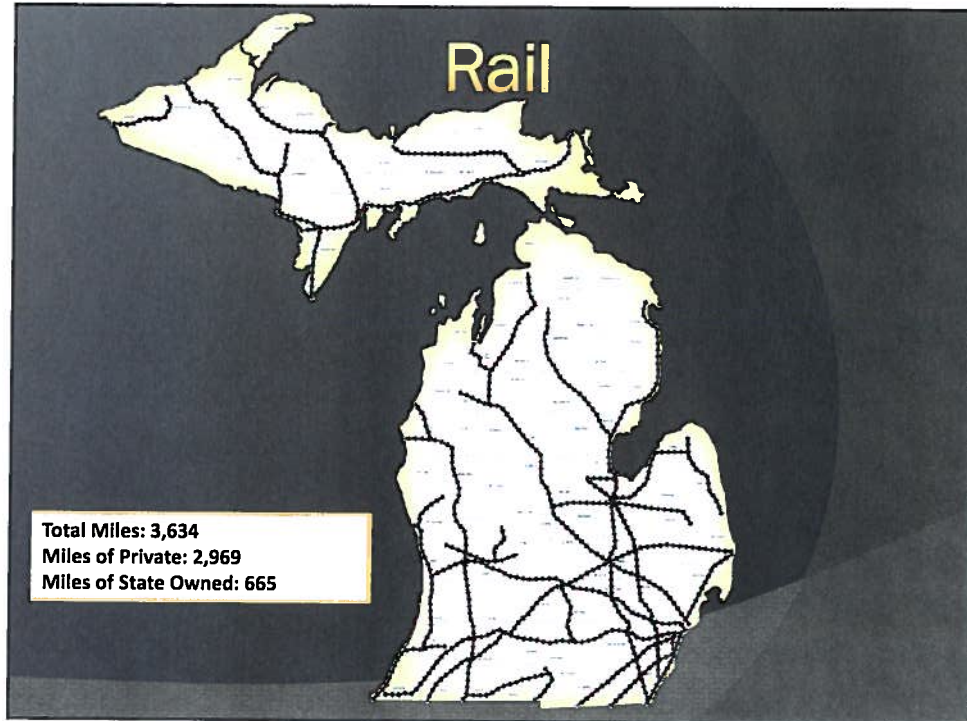
## Public Roads

Freeway: 1,956 route miles  
Non-Freeway: 120,215 route miles Total  
Lane Miles: 265,600









## Passenger Modes

### MDOT assists:

- 78 transit and 38 specialized service agencies, providing over 95 million passenger trips per year in 83 counties in 2013
- 3 Amtrak passenger rail routes, serving over 805,000 passengers in 2013
- 5 intercity bus systems





## Passenger Modes (cont.)

### MDOT assists:

- 18 commercial airports, serving over 34 million passengers in 2013
  - 213 general aviation airports
  - 4 state-owned airports MDOT oversees
- 26 railroads carrying over 60 million tons of freight per year
  - 4 of the 26 are major freight railroads
- 37 commercial ports, handling 70-90 million tons per year



## Michigan is a Transportation Leader

- Asset management
- Capital Preventive Maintenance
- Construction Quality Partnership Training
- Road Quality Forecasting System
- Context-sensitive design solutions
- Performance measurement
- Performance warranties
- Trailway development
- Local Complete Streets policies



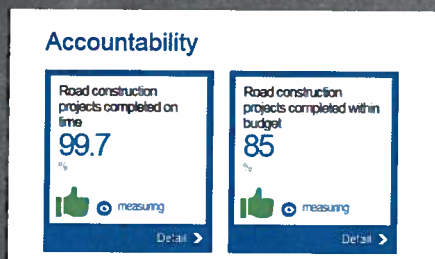
## Building Partnerships

- Contractors/Consultants
- University Research
  - MI Tech, MSU, U of M
- Local Agencies
  - Transportation Asset Mgmt. Council
- Other State Agencies
  - Governor's Intergovernment Coordinating Committee
- Other States/Provinces
  - I-94 operations, Midwest Regional Rail Initiative
- Private Business



## Performance & Accountability

- Michigan Dashboard
- Infrastructure Dashboard
- MDOT's Scorecard
- MDOT System Measures
- Asset Management Council
- FHWA Stewardship Agreement
- Good Government in Action



<https://midashboard.michigan.gov/infrastructure>

[www.michigan.gov/mdot](http://www.michigan.gov/mdot)



## Efficiencies

- \$111M in one-time savings by bond refinancing
- Major reorganization and innovative cost-saving measures saved \$55 million in 2011
- Additional innovative cost saving measures over past 4 years are saving \$51M per year
  - Asset management
  - Energy efficiency
  - Performance measures
  - Construction warranties
  - Innovative contracts
  - Innovative finance
  - New technologies
  - Partnerships



MDOT

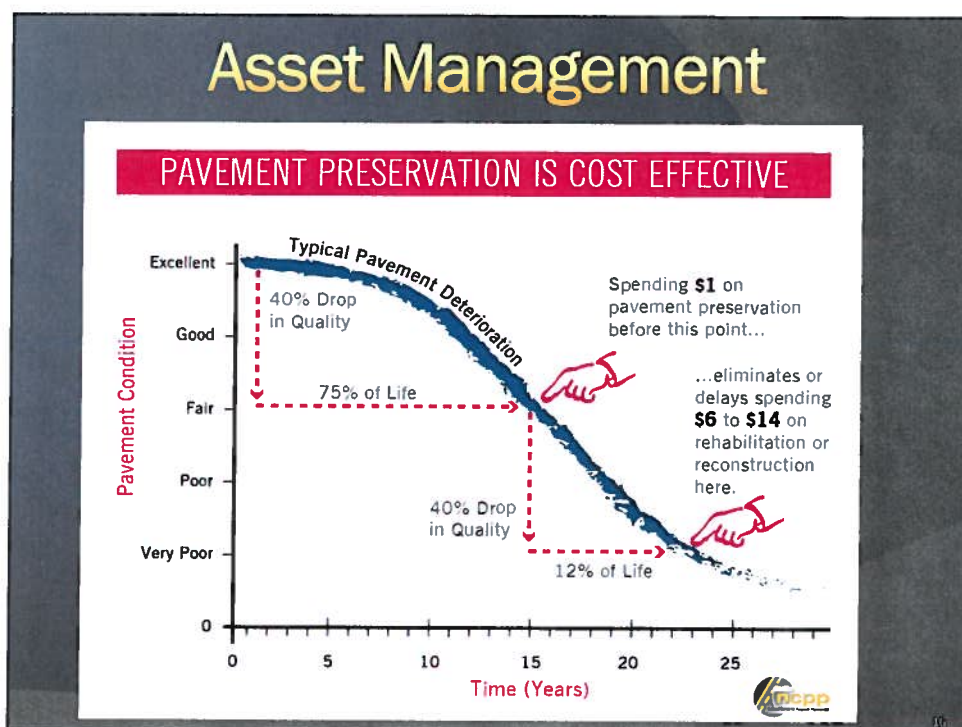
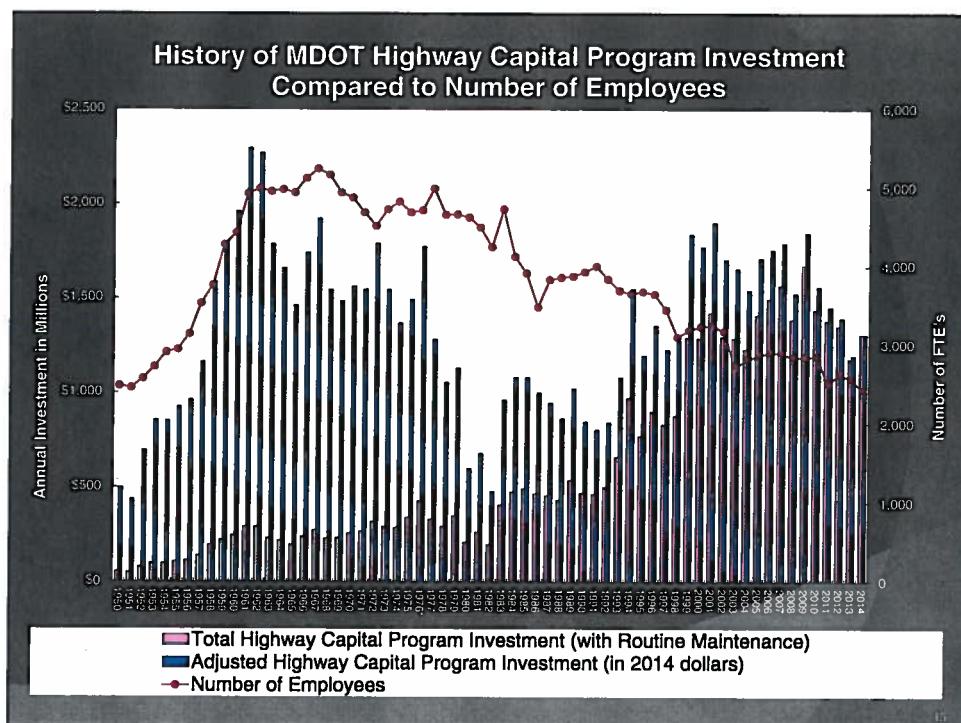
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## Construction Program Management

Five Year Summary of MDOT Projects

| Calendar Year | Original Contract Cost | Final Contract Cost | Percent Difference |
|---------------|------------------------|---------------------|--------------------|
| 2010          | \$615,818,269.64       | \$615,142,561.83    | -0.11%             |
| 2011          | \$833,072,906.02       | \$842,999,015.92    | 1.19%              |
| 2012          | \$771,130,483.23       | \$768,530,401.94    | -0.34%             |
| 2013          | \$1,127,211,347.22     | \$1,139,133,968.99  | 1.06%              |
| 2014          | \$618,364,582.06       | \$620,805,748.44    | 0.39%              |

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## How Pavement Projects are selected:

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### Considerations:

- Current condition
- Projected pavement deterioration

2

### Strategy:

"Right fix at the right time on the right road."

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### Prioritize:

Safety  
Road Condition  
Traffic Volume  
Public Input  
Maintenance Costs

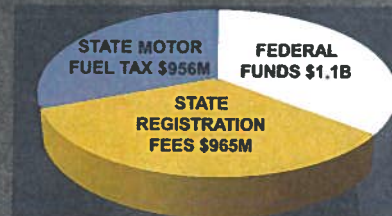
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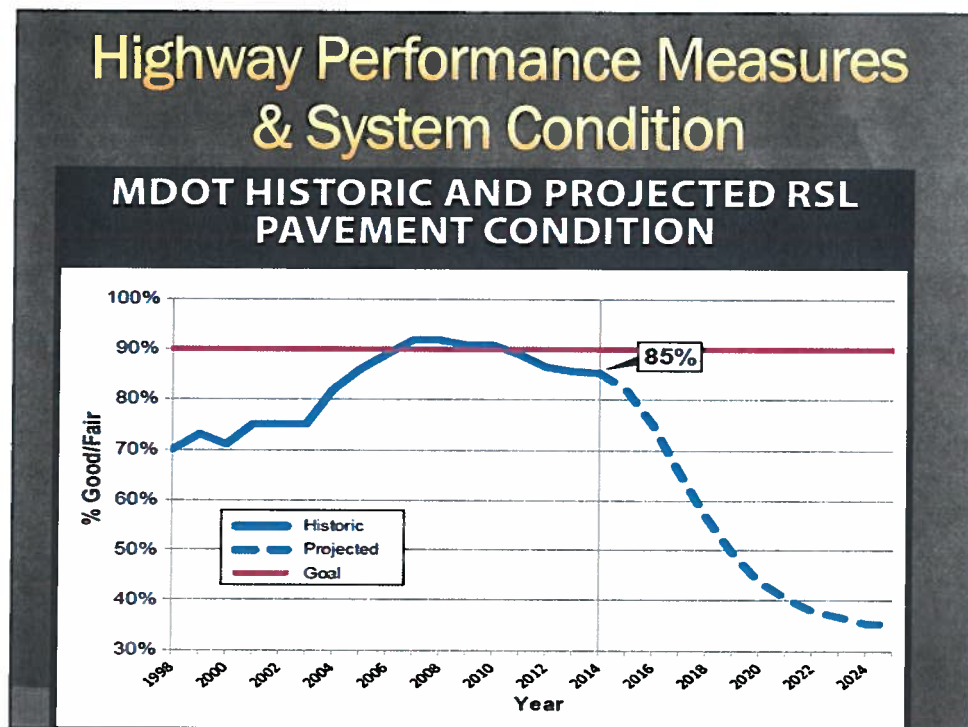
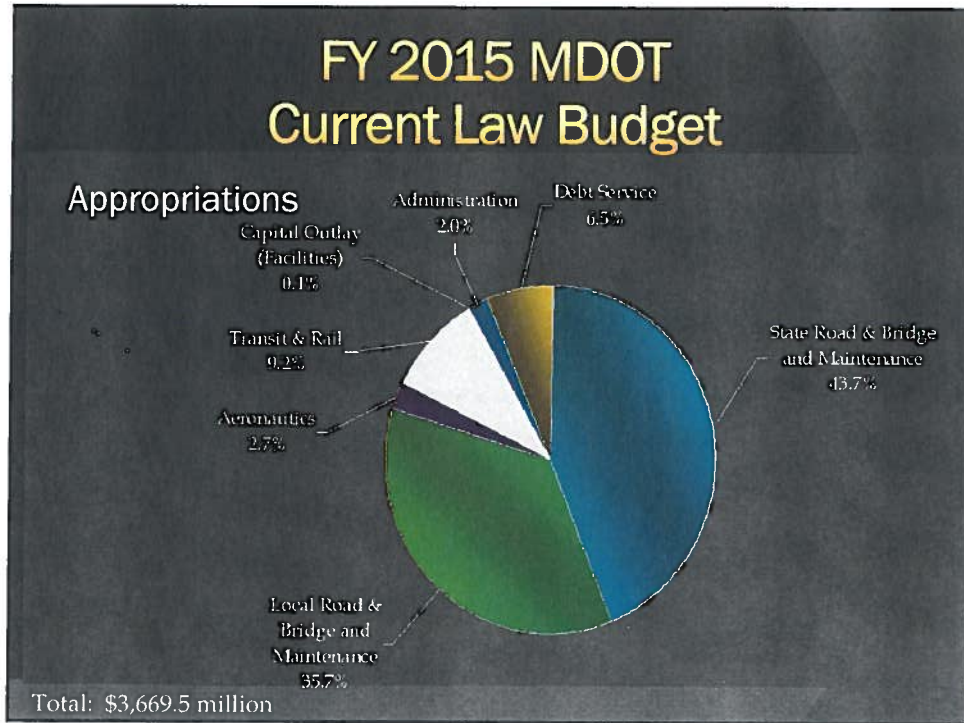
### Challenge:

Declining revenue and  
Growing pavement  
needs

## Transportation Funding

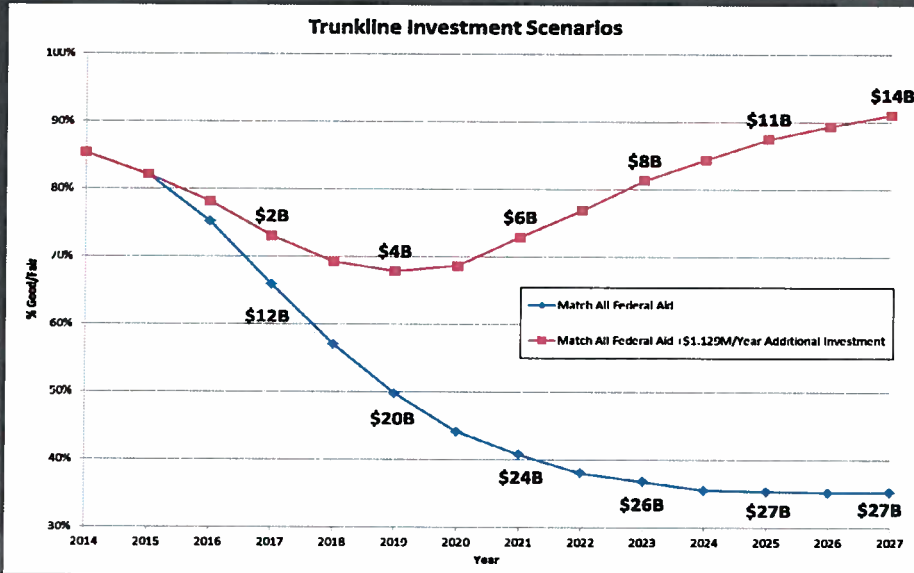
- Roads and Bridges
  - Federal funds: \$1.1 billion
    - Includes \$240 million for local agencies
  - State motor fuel taxes: \$956 million
  - State registration fees: \$965 million
- Transit and Rail – Federal funds, local funds, state restricted funds from fuel taxes, registrations, and sales taxes (\$342 million)
- Aviation – Federal funds, local funds, state fuel taxes and registration fees (\$102 million)







# Pay Now or Pay Later



## Successful Innovations Carbon Fiber



M-102 over Plum Creek in Detroit is MDOT's first use of CFRP pre-stressing strands

## Successful Innovations US-131 Lateral Bridge Slide

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## Concrete Innovations

- Roller Compacted Concrete
  - Competitive Alternative for Low Volume Paving Applications
- Stringless Paving (3D Paving)
  - Reduced Construction Staking Costs
  - Improves Safety
  - Improves Speed of Paving
- Improved Supplementary and Blended Cements for Environmental Sustainability
  - Enhanced Concrete Durability
  - Reduced Carbon Footprint



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## Asphalt Innovations

### • Regressing Air Voids In Production

- Design to 4%, Regress to 3% In Production
- Results in More Asphalt Cement in Mix
- Increased Density, Increased Performance

### • Fine Graded Mixes on Top Course

- Eliminate Dry, Coarse Mixes
- Resistant to Cracking
- Better Performance

### • Incentive for Ride Quality

- Promotes better Construction Practices/Innovation from Contractors
- Improved Ride for Traveling Public



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## Design Innovations

### • 3D Model Requirements and RID

- Software, Training, and Standards
- Delivery of electronic design data to construction
- 3D Engineered Model Data for use in construction



### • Enterprise Document Management

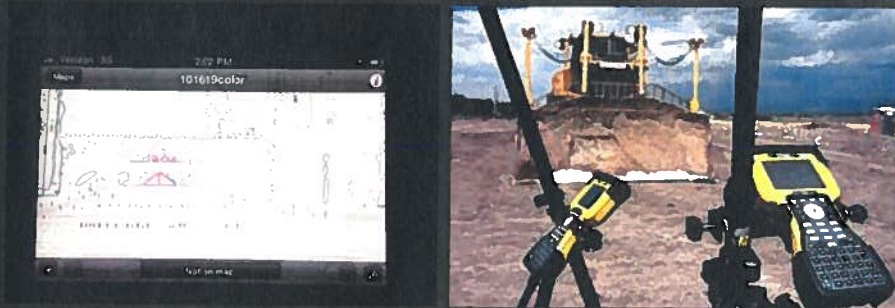
- Electronic document management via ProjectWise
- Department-business processes including e-Construction
- 3D Modeling allows contractors to use GPS for machine grading
- E-Sign eliminates 7.4M sheets of paper, could save \$4M a year
- Developing workflows, training, support and mobility solutions

### • LiDAR Mass Data Acquisition Pilot

- Pilot project in the Muskegon TSC area
- Mass geospatial data acquisition for asset collection, design purposes and data management practices.



## Successful Innovations E-Project



- 3D Modeling allows contractors to use GPS for machine grading
- E-Sign technology eliminates 7.4 million sheets of paper and could save \$4 million a year

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# Questions?



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**Revenue Dedicated Bonded Debt**  
**Michigan Department of Transportation**  
**Bonds Issued and Outstanding**  
(In Thousands)

**Comprehensive Transportation Fund Bonds:**

|  | AMOUNTS<br>ISSUED | OUTSTANDING<br>9/30/2014 | OUTSTANDING<br>9/30/2013 | MATURITIES    |              | AVERAGE<br>INTEREST<br>RATE |
|--|-------------------|--------------------------|--------------------------|---------------|--------------|-----------------------------|
|  |                   |                          |                          | FIRST<br>YEAR | LAST<br>YEAR |                             |
| Series 2005 (Refunding)                              | \$ 62,180         | \$ 53,750                | \$ 58,070                | 2009          | 2023         | 5.15                        |
| Series 2006 (Revenue and Refunding)                  | 53,685            | 35,015                   | 40,665                   | 2007          | 2031         | 4.54                        |
| Series 2009 (Refunding)                              | 42,335            | 36,870                   | 38,780                   | 2012          | 2019         | 4.11                        |
| Series 2011 (Refunding)                              | 18,470            | 16,020                   | 17,650                   | 2013          | 2022         | 4.35                        |
| Series 2013 (Refunding)                              | 10,130            | 9,105                    | 10,130                   | 2014          | 2023         | 4.67                        |
| <b>Total Comprehensive Transportation Fund Bonds</b> | <b>\$ 186,800</b> | <b>\$ 150,760</b>        | <b>\$ 165,295</b>        |               |              |                             |

**State Trunkline Fund Bonds:**

|   |                     |                     |                     |      |      |      |
|---|---------------------|---------------------|---------------------|------|------|------|
| Series 1998 A (Refunding)               | \$ 377,890          | \$ 146,085          | \$ 169,965          | 2006 | 2019 | 5.03 |
| Series 2004 (Refunding)                 | 103,450             | 82,390              | 90,510              | 2006 | 2022 | 4.13 |
| Series 2004                             | 185,710             | -                   | 20,785              | 2008 | 2014 | 4.36 |
| Series 2005 (Refunding)                 | 223,020             | 223,015             | 223,015             | 2010 | 2023 | 5.10 |
| Series 2005 B (Refunding)               | 378,250             | 38,510              | 248,205             | 2010 | 2015 | 4.81 |
| Series 2006                             | 244,525             | 50,250              | 167,410             | 2008 | 2017 | 4.74 |
| Series 2009 (Revenue and Refunding)     | 146,190             | 146,190             | 146,190             | 2018 | 2027 | 4.76 |
| Series 2011                             | 90,980              | 88,825              | 90,980              | 2014 | 2037 | 4.58 |
| Series 2012 (Refunding)                 | 49,305              | 44,330              | 49,305              | 2014 | 2022 | 4.78 |
| Series 2014 (Refunding)                 | 265,085             | 265,085             | -                   | 2016 | 2022 | 4.36 |
| <b>Total State Trunkline Fund Bonds</b> | <b>\$ 2,064,405</b> | <b>\$ 1,084,580</b> | <b>\$ 1,206,365</b> |      |      |      |

**Grant Anticipation Bonds:**

|   |                   |                   |                   |      |      |      |
|---|-------------------|-------------------|-------------------|------|------|------|
| Series 2007                               | \$ 485,115        | \$ 443,055        | \$ 451,505        | 2009 | 2027 | 4.87 |
| Series 2009 B Taxable Build America Bonds | 281,910           | 281,905           | 281,905           | 2012 | 2027 | 7.63 |
| <b>Total Grant Anticipation Bonds:</b>    | <b>\$ 767,025</b> | <b>\$ 724,960</b> | <b>\$ 733,410</b> |      |      |      |

**TOTAL REVENUE DEDICATED BONDED DEBT -  
TRANSPORTATION RELATED**

|                     |                     |                     |
|---------------------|---------------------|---------------------|
| <b>\$ 3,018,230</b> | <b>\$ 1,960,400</b> | <b>\$ 2,105,070</b> |
|---------------------|---------------------|---------------------|